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U-006-306 .50

OPERABLE UNIT 4 PILOT PLANT PHASE II TREATABILITY STUDY WORK PLAN

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DOE-2187-94
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COMMENTS/LET

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U-002-306.50

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2086

Dear Mr. Saric and Mr. Schneider:

OPERABLE UNIT 4 PHASE II TREATABILITY STUDY WORK PLAN - PILOT PLANT

Enclosed for your approval is the revised Operable Unit 4 Phase II Treatability Study Work Plan for vitrification of the K-65 and Silo 3 material. The Work Plan has been revised to incorporate your previous comments. To facilitate your review, a comment response document has also been included in the enclosed package.

If you have any comments or questions, please contact Randi Allen at (513) 648-3102.

Sincerely,

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Allen

Enclosures: As Stated

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OHIO EPA COMMENTS
ON
OPERABLE UNIT 4 PILOT PLANT PHASE II

1. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Page #: Line #: Code: C
Original Comment #: 1

Comment: The methods used to control air emissions are difficult to follow. Potential emissions and what FEMP is proposing in order to control these emissions are spread throughout the document, therefore difficult to understand. All air issues, including potential emissions and controls, should be listed together in one section of the document.

Response: Off-gas controls are discussed in several sections of the document under design, operation, sampling and analysis, residuals management, and regulatory/permitting requirements. Organizational changes will be made to the text to cross reference and clarify the requirements and eliminate redundancy.

Action: The following changes will be made to the text to clarify air emission control procedures:

1. Section 4.0 - More detail will be provided under Section 2.1.1 for radon control at the silos. This will also satisfy OEPA Comment #12. The subheading "Melter" will be added to Section 2.1.1 to focus on technical design for the melter; the off-gas system described in the old section (page 4-6, lines 16-21) will be deleted and moved to Section 2.1.1. The "Off-Gas System" design discussion in Section 4 will be expanded by pulling all design information out of other parts of the document. The heading for old Section 4.4 "Pilot Plant Testing" will be changed to avoid confusion between sampling and analytical operations (which will remain in Section 6.0).

   In addition to the above reorganizational changes affecting the off-gas system, the following changes will be made in accordance with USEPA guidance toward reorganization of other parts of the document:

   1. Section 1.0 will be restricted to include general and programmatic information, such as site background including history and OU4 description. Technical information will be removed and placed in appropriate sections of the document under design or operation.

   2. Section 2.0 will be modified to include a description of the remedial technology and processes being evaluated in the Treatability Study. This information will be moved from Section 4.0. The discussion of other proposed remedial alternatives will be deleted or reduced and incorporated into Section 1.0.

   3. Section 16.0, containing regulatory compliance requirements, will be moved to follow Section 10 "Residuals Management" compliance section.

2. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Page #: Line #: Code: C
Original Comment #: 2
Comment: The FEMP is proposing a project utilizing data obtained from Phase I when Phase I has not been carried out. It seems as if a Phase II document should not be written until the results from Phase I have been reviewed. If the two projects are taking place within a short period of time, any changes will have to be approved by OEPA and included as an addendum to the Phase II Work Plan before the project continues.

Response: Phase I focuses on equipment and startup with surrogate being run to confirm equipment operability and conformance to specification. The actual treatability testing of LLRW occurs in Phase II. The project was divided into two phases to minimize the overall project duration not activities.

Action: Any changes to the "approved" Phase II Work Plan will be submitted for review and approval.

3. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Page #: Line #: Code: C
Original Comment #: 3
Comment: The building design for this project should keep future demolition and decontamination activities in mind. Whenever possible, non-porous materials and materials that can be reused should be utilized.

Response: Materials for the Pilot Plant were selected primarily to meet specific design criteria while maintaining reasonable costs. Much of the material will have some degree of surface contamination after OU4 remediation is complete. Most of the building materials are non-porous. The concrete floors and shielding walls will be sealed to inhibit penetration of contaminants. If it then becomes feasible to decontaminate and reuse/recycle the material, CRU4 will take this course of action as appropriate.

Action: None.

4. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.3.2 Page #: 1-7 Line #: 11 Code: C
Original Comment #: 4
Comment: Can the PNL test be a fair representation of the vitrification project to be conducted at the FEMP? The PNL test utilized only 15 lbs. of materials. The FEMP project will operate on a much larger scale. Can the data from the 15 lb. test be accurately extrapolated for the purposes of this project? The FEMP should also consider and include information in the work plan regarding the use of the Product Consistency Test.

Response: The PNL tests were conducted in accordance with the USEPA "Guide for Conducting Treatability Studies under CERCLA," dated October 1992, and an approved Treatability Study Work Plan. The primary purpose of the project is to confirm the PNL results for Remedy Screening on a larger scale with equipment that runs on a continuous basis. The Product Consistency Test (PCT) is used for comparison purposes. The length of time

for completing the PCT makes it difficult to integrate the results into the subsequent test runs in the Pilot Plant. The PCT test can not be used as the basis for establishing a subsequent operational mode, but in a final confirmatory role, the test is useful in evaluating the test results.

Action: None.

5. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.4.2 Page #: 1-12 Line #: 12-14 Code: C
Original Comment #: 5
Comment: The text states that "small scale tests of systems for removal of radon from the off-gas stream are needed to provide data for designing a radon control system for processing operations." Yet, Lines 12-14 discuss only a radon adsorption experiment utilizing activated carbon. Are other radon removal systems under experimentation? If so, please discuss these other options in detail. If the FEMP is only experimenting with activated carbon, please explain what contingencies will be used for radon control to prevent project delays.

Response: Only carbon beds are being tested. Each of the two 40,000 lb. carbon beds that are included in the design are theoretically adequate. The contingency plan is that if one bed is inadequate, both beds will be used (either in paralleled or in series) to adequately control radon emissions.

Action: None.

6. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.4.2 Page #: 1-12 Line #: 13 Code: C
Original Comment #: 6
Comment: The document states that data from a radon adsorption experiment utilizing granular activated carbon will be ready this summer. This data will need to be reviewed by OEPA before vitrification takes place.

Response: The data will be made available to OEPA. The current schedule has this testing pushed back to October - November of this year with results available in January 1995.

Action: None.

7. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.4.3 Page #: 1-15 Line #: 19 Code: C
Original Comment #: 7
Comment: What was the alternative to carbon as listed in the text?

Response: Carbon was eliminated by partially substituting Na_2O with CaO. The justification for using the combination of CaO and Na_2O is presented at the top of Page 1-15.

Action: Text will be added to Section 1.4.3 to clarify and explain that CaO combined with Na_2O is being used as a substitute for carbon.

8. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Page #: 2-2 Line #: 5 Code: C
Original Comment #: 8
Comment: Please provide detailed information regarding the control of radon and other particulate emissions when materials are removed from the silos utilizing the hydraulic removal system.

Response: The current Section 2.0 is a listing of alternatives for final remediation. Per the request of the USEPA, the subject matter of Section 2.0 will be revised and the remedial alternatives will be moved to Section 1.0 and limited to the alternatives being included in the proposed Record of Decision. Design of the radon control systems to be used at the silos will be described in the revised Section 2.0.

Action: Control of radon and other particulate emissions during use of the hydraulic removal system will be described in detail in the revised Section 2.0.

9. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.2.2 Page #: 3-2 Line #: 9 Code: C
Original Comment #: 9
Comment: The document comments on the control of radon in the silo emptying and vitrification process. However, there is no information regarding the control of uranium and the other daughter radionuclides. Can all of the radionuclides be controlled by utilizing the same methods as radon? Also, please address the controls that will be used for volatile metals such as arsenic and mercury.

Response: Radionuclides other than radon are particulates and will be controlled by the scrubber and HEPA filter in the off-gas treatment system. Volatile metals will condense in the quench tower/scrubber system. Any volatile metals that pass through as particulates will be captured by the HEPA filter.

Action: The text in Sections 2.1.1 and 3.2.7 will be revised to clarify the control of particulate and volatile radionuclides.

10. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.2.2 Page #: 3-2 Line #: 9 Code: C
Original Comment #: 10
Comment: This sentence states that radon concentrations must be maintained below required levels. Please state these levels within this section.

Response: The Pilot Plant Treatability Study project is being conducted under CERCLA. As required under CERCLA, DOE has identified potential applicable or relevant and appropriate requirements (ARARs) to be followed during the project (see Appendix C of the Work Plan). Although not specifically identified as ARARs for this project, existing site legal documents, and regulations pertaining to worker safety may also contain requirements that affect the management of radon. The conditionally approved OU4 FS/PP-DEIS provides a complete discussion of regulatory requirements, including ARARs, that pertain to remediation of the radon producing silo material within OU4.

Three regulatory requirements have been identified that will govern the management of radon during Phase II Pilot Plant activities. Following is a summary of these requirements:

1. The primary requirement for management of radon during Pilot Plant operation is not an ARAR, but is a "to be considered" (TBC) requirement found in DOE Order 5400.5. Derived Concentration Guides (DCGs), which limit the concentration of radon that may be released into the accessible environment during operations, are given in Chapter IV. This level, which governs permissible site boundary radon concentrations during Pilot Plant operation, has been established at 3 pCi/l.

2. Another TBC, which governs management of radon released from the vitrified silo residuals, is found in DOE Order 5400.5 Chapter IV.6.b. This TBC limits releases of radon into the air above an interim storage facility to the following:

   - 100 pCi/l concentration at any given point;
   - An annual average concentration of 30 pCi/l over the facility site; and
   - An annual average concentration of 3 pCi/l at or above any location outside the facility site.

   This TBC does not pertain to interim storage of material in the silos, which are covered by existing legal agreements.

3. A potential ARAR, included in the Work Plan, which would also govern management of the vitrified silo residuals, is found in USEPA's 40 CFR § 61 Subpart Q. This CAA NESHAP limits releases of radon into the air during periods of storage and disposal to less than or equal to 20 pCi/m^2-s of Radon-222 as an average for the entire source. Storage of the vitrified residuals from Pilot Plant operations prior to disposal will be in accordance with this ARAR.

Action: The text of Section 3.2.2 will be revised to indicate a discussion of radon regulatory requirements will be found in Section 11.4.

11. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.1 Page #: 4-2 Line #: Figure 4-1 Code: C
Original Comment #: 11
Comment: This diagram of the CRU4 Pilot Plant is extremely difficult to read. Please enlarge this figure or enlarge accordingly.

Response: The figure (4-1) will be enlarged for clarity.

Action: An 11 x 17 figure will be included in the work plan replacing the 8 x 11 figure.

12. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.1.1 Page #: 4-5 Line #: 13 Code: C
Original Comment #: 12
Comment: Again, FEMP needs to describe the control of radon and other emissions when removing materials from the silos. A bag-in/bag-out process is listed as radon control, but this

process and the resulting control of radon emissions is not clearly understood. Please clarify the control process.

Response: The bag-in/bag-out process will be clarified in the revised Section 2.0.

Action: The following will be added to this section: "Bag-in/bag-out" refers to the use of a heavy-duty, transparent plastic glove bag to maintain a seal on the silo. Equipment to be inserted into a silo is encased in the glove bag and the bag is sealed to the silo manway before the manway lid is removed. Once the lid is removed, the bag becomes the seal between the silo headspace and the atmosphere.

13. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.1.1 Page #: 4-5 Line #: 25 Code: C
Original Comment #: 13
Comment: The exhaust from the pneumatic removal system for Silo 3 will be filtered. Clarify the filter(s) and the filtering process that will be used.

Response: Text describing the filtration system will be expanded.

Action: The following will be added to the revised Section 2.0: ...closed-loop system. Conveying air and solids will be separated in a bag-house dust collector. The solids will drop into a hopper and the air will go to the vacuum blower unit. The air passes through a pre-filter and HEPA filter prior to the blower and is then discharged back into the Silo 3 headspace.

14. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.1.2 Page #: 4-6 Line #: 23 Code: C
Original Comment #: 14
Comment: Will the amount of sodium carbonate and calcium carbonate added to the vitrification process be enough to warrant particulate control measures in the area that these materials are being handled?

Response: Yes. Particulate controls will be used.

Action: Text will be added as follows in the revised Section 2.0 (formerly Section 4.1.2) under the subheading "Additives": The bag dump station will have its own ventilating fan and dust filters to control fugitive dust during the dumping operation. The additives will be pneumatically conveyed into a filter/receiver unit. Exhaust from the filter receiver will to be vented to a vacuum blower and HEPA filter unit prior to discharge via the exhaust stack.

15. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.4.1 Page #: 4-12 Line #: 9 Code: C
Original Comment #: 15
Comment: Explain the relationship between the thickener and thickener overflow water.

Response: The thickener is designed to increase the solids content of the slurry from 15-20 wt percent solids to 50 wt percent solids. The thickener overflow water will flow by gravity

to the recycle water tank where it will be used to supply the quench tower and the hydraulic miner (as required). Section 4.1.2, page 4-7 explains this.

Action: None.

16. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Page #: 5-1 Line #: 3-5 Code: C
Original Comment #: 16
Comment: This section states that several equipment items have been identified at the FEMP site, and the feasibility for their potential use is being investigated by FERMCO. Please include a time frame within this text which describes when the analysis of this equipment will be completed, and also where the results of this analysis will be reported.

Response: On-site equipment has been identified and incorporated into the Pilot Plant design. Plans have been made with the appropriate on-site departments to remove, decontaminate if necessary, and deliver the equipment to the Pilot Plant for installation and testing.

Action: The text in Section 5.0 will be revised to reflect the response to Comment 16.

17. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Page #: 5-2 Line #: Table 5-1 Code: C
Original Comment #: 17
Comment: The design capacity of the HEPA filter and exhaust stack are rated at 200 cfm. On Page 10-2, the stack size is based on a 7000 scfm maximum flow rate. Also, on Page 5-3, a 6600 cfm stack is listed. Does FEMP anticipate running the HEPA and exhaust system above 200 cfm? Please clarify. If it is possible for more volume to run through the stack, the HEPA and exhaust system will need to be modified.

Response: The 200 cfm equipment (4-FL-14, 4-XS-15, and 4-FA-16) is to support the Silo 1 and 2 Radon Treatment System (RTS) during remedial operations. The stack will accommodate the 7000 cfm maximum flow mentioned on Page 10-2 in support of furnace off-gas which is a separate system from the Silos 1 and 2 RTS.

Action: An updated equipment list will replace the original equipment list (Table 5-1).

18. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 14.1 Page #: 14-3 Line #: Figure 14-2 Code: C
Original Comment #: 18
Comment: Please change the Ohio EPA project manager to Thomas A. Schneider.

Response: Acknowledged.

Action: Figure 15-2 will be revised accordingly.

TECHNICAL REVIEW COMMENTS ON OPERABLE UNIT 4 PILOT PLANT PHASE II TREATABILITY STUDY WORK PLAN

GENERAL COMMENTS

1. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original Comment #: 1

Comment: Many of the U.S. Environmental Protection Agency (U.S. EPA) comments made on the Phase I Treatability Study Work Plan (TSWP) were disregarded because the U.S. Department of Energy (U.S. DOE) claims that Phase I focused on engineering-related performance goals. If Phase I was to focus on "engineering-related" (waste retrieval) activities, then the information should have been presented in some format other than that of a TSWP. Also, this objective should have been clearly stated in the document. U.S. EPA reviewed the Phase I TSWP with the understanding that Phase I activities included not only waste retrieval, but also treatment of the surrogate waste material. It is unclear why Phase I and Phase II studies are not considered separate TSWPs and as such, U.S. DOE should address all concerns related to each.

Response: Phase I is the proving stage or testing grounds for not only waste retrieval and the vitrification process of surrogate material but for all the equipment throughout the plant. It is considered essential that all unit operations of the Pilot Plant process are proven to be operational prior to treatability testing of the actual Low Level Radioactive Waste material in Phase II. The objectives of Phase I are explained in Section 1.3.1 of the Phase I Work Plan. This will enable DOE to incorporate all lessons learned from Phase I operations and more fully understand what will be expected during Phase II operations. The actual treatability study does not begin until Phase II. The EPA guidance document format was chosen for the Phase I Work Plan to provide the reviewers with a format that is familiar to them.

Action: All USEPA comments will be addressed in the Phase II Work Plan.

2. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original Comment #: 2

Comment: U.S. DOE frequently references the "Operable Unit (OU) 4 Treatability Study Report for Vitrification of Residues from Silos 1, 2, and 3, May 1993" as the source of experimental design information applicable to the Phase I and Phase II TSWPs. The referenced report presents information for the bench-scale treatability studies and does not apply to the current TSWPs. U.S. DOE should include pilot plant-scale experimental design information in the Phase I and Phase II TSWPs.

Response: See Response for General Comment and Response for Specific Comment #9.

Action: See Action for Specific Comment #9.

3. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original Comment #: 3
Comment: The Phase II TSWP references U.S. EPA guidance on conducting treatability studies (U.S. EPA 1992). Although the work plan includes all major sections identified in the guidance, it lacks specific information and details in several sections, specifically, Sections 2.0, 3.0, 4.0, and 6.0. U.S. DOE should revise these sections to include the information required by the guidance and these comments.

Response: Acknowledged.

Action: Text will be added and rearranged in the work plan to reflect General Comment #3, and specific comments #1, #2, #6, #11, and #17.

SPECIFIC COMMENTS

1. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.2 Page #: NA Line #: NA Code:
Original Comment #: 1
Comment: According to U.S. EPA guidance, Section 1.0 of the TSWP should summarize existing waste characterization data. Section 1.2 should specifically reference the OU4 Remedial Investigation (RI) report and Appendix A of this TSWP as the sources of additional information on silo waste characterization.

Response: Agree.

Action: Text will be added to Section 1.0 to summarize existing waste characterization data. The following will be added to Section 1.2:

Silo waste characterization information was extracted from the Remedial Investigation (RI) Report for OU4, November 1, 1993, and is included in Appendix A of this Work Plan.

2. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.3.1 Page #: 1-5 Line #: 30 Code:
Original Comment #: 2
Comment: Because this sentence states that remedial alternatives will be described in Section 2, it should be deleted. U.S. DOE should instead briefly discuss remedial alternatives in Section 1.2, History and Operable Unit Description. Section 2.0 should describe the waste retrieval and vitrification processes and unit operations. The text should be revised to reflect these changes.

Response: Agree.

Action: Line 30 will be deleted from Section 1.3.1. Remedial alternatives will be moved from Section 2.0 and briefly discussed in Section 1.2. Text from Section 4.1.1 describing the waste retrieval and vitrification technologies will be moved to Section 2.0.

3. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.4.2 Page #: 1-8 Line #: 8 Code:
Original Comment #: 3
Comment: Line 8 references the vitrification work plan but cites the resulting report. This discrepancy should be corrected.

Response: Agree.

Action: Change line 7 from "OU4 Treatability Study Report" to "OU4 Treatability Study Work Plan".

4. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.4.3 Page #: 1-13 Line #: 17 and 18 Code:
Original Comment #: 4
Comment: Tables 1-2, 1-3, and 1-4, that are referenced on these lines, are missing from this section. U.S. DOE should provide these tables.

Response: Agree.

Action: Change line 17 to "Sequences A and B, and D from the treatability tests are listed in Tables 4-1 and 4-2".

5. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.4.3 Page #: 1-15 Line #: 21 and 22 Code:
Original Comment #: 5
Comment: The text discusses eliminating carbon from the formulation to avoid reduced metals. U.S. DOE should indicate the alternative to carbon that was used and that did not reduce metals.

Response: Carbon was eliminated by partially substituting CaO for Na_2O.

Action: The text in Section 1.4.3 will be revised to reflect this.

6. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.0 Page #: NA Line #: NA Code:
Original Comment #: 6
Comment: According to U.S. EPA guidance, Section 2.0 should present the treatment technology description, including flow diagrams, input and output streams, and should discuss each unit operation. Section 2.0 currently presents the remedial alternatives provided in the OU4 Feasibility Study (FS) report. Section 2.0 should be revised to discuss each step of the waste retrieval and vitrification processes. Some of the information required for Section 2.0 is currently provided in Section 4.0 and should therefore be moved to Section 2.0.

Response: Agree.

Action: Section 2.0 will be revised to address the concerns raised by Comment #6.

7. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2 Page #: 3-1 to 3-3 Line #: NA Code:
Original Comment #: 7
Comment: The information presented in Section 3.2 should be summarized in a table. The table should relate each piece of data collected to one of the study objectives. The table should include the performance objectives, the parameters to be measured or monitored that support each objective, and the analytical support level that is required. Attachment A, Table A-1, is provided as an example table.

Response: Agree.

Action: Table 3-1 will be added to address this comment.

8. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.5 Page #: 3-2 Line #: NA Code:
Original Comment #: 8
Comment: This section discusses vitrification objectives. The discussion of vitrification should include determination of an optimum retention time.

Response: Agree.

Action: The following will be added to Section 3.2.5: Another objective is to determine the optimum retention time in the furnace. This is the maximum throughput the furnace can accommodate while producing a satisfactory glass product.

9. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.0 Page #: NA Line #: NA Code:
Original Comment #: 9
Comment: According to U.S. EPA guidance, Section 4.0 should describe the experimental design of the treatability study. This section should present the volume of waste material to be tested, the critical parameters to be studied and how they will be varied, and the degree of replication. The experimental design section text should provide sufficient detail to permit the field technician to conduct the test, operate the equipment, and collect the samples with minimal supervision. This section should also include a table summarizing each set of test conditions and indicating the number of replicates. Attachment B and Table B-1 provide examples of introductory text and a table that should appear in Section 4.0.

Response: The DOE requires that field work be controlled by specific procedures. Those procedures are very detailed and provide specific guidance for the "field technician." That detail cannot be finalized until all vendor and design information has been received to verify control equipment. A detailed test specific Test Plan, which will include test objectives, sequence definition, and test procedures will be written by October 15, 1994. The Test Plan will provide sufficient detail to conduct system operability testing, equipmentperformance testing, and acceptable glass formulas. This response also applies to Comment #17.

Action: A subsection will be added in Section 4.0 that will describe test sequences. A discussion of the purpose of a detailed test plan will also be included. The Test Plan will not be a

part of the Phase II Work Plan but will be produced as a stand alone document after the Phase II Work Plan is resubmitted.

10. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.0 Page #: NA Line #: NA Code:
Original Comment #: 10
Comment: Figures 4-1, 4-2, and 4-3 are difficult to read. Figures 4-1 and 4-2 should be provided on 11- by 17-inch paper to allow better image quality and to increase the print size. Figure 4-3 provides a block diagram of the process flow. for clarity, flow arrows for different media should be represented by distinct line designations. For example, a heavy line could represent the solid/slurry waste stream, a dashed line could represent water/liquid streams, and a dotted line could represent gaseous emissions.

Response: Agree.

Action: Figures 4-1 and 4-2 will be replaced with 11 x 17 copies. Figure 4-3 will be revised to show flow arrows and line designations. The Figures will be moved to Section 2.0 as requested in Comment #6.

11. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1 Page #: NA Line #: NA Code:
Original Comment #: 11
Comment: The information presented in this section that describes the unit operations should be moved to Section 2.0. Unit operation information should include the capacity and materials of construction for each piece of equipment, and should indicate the influent and effluent streams and flow rates.

Response: Agree.

Action: Section 4.1 will be moved to Section 2.0. Text will be added to Section 2.0 to address this comment.

12. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.1 Page #: 4-5 Line #: 16 Code:
Original Comment #: 12
Comment: This section discusses radon control at the silos. The text should indicate between which radon concentrations in the silo head space the radon treatment system will operate.

Response: Operation of the RTS is not a direct function of radon concentration in the silo head space, but rather the penetrating radiation caused by the radon and its daughter products in the head space. The radon treatment system will be operated in the event that both the on-contact surface dose on the dome exceeds 100 mrem/hr and direct personnel access to the dome surface is required. Personnel are not allowed to be on the dome when the surface dose rate exceeds 100 mrem/hr.

Action: The following will be added at the end of the first paragraph after "Radon Control at Silos" in Section 2.1.1..

The RTS will be operated as a function of the need for personnel access and the penetrating radiation dose levels on the silo dome surface. The trigger level for operation

of the RTS is 100 mrem/hr at the dome surface when personnel require access to the domes.

13. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Page #: 4-6 Line #: 9 Code:
Original Comment #: 13
Comment: This section discusses melter. The text should be revised to indicate how agitation will be incorporated into the melter.

Response: Agree.

Action: The following will be added to the first paragraph of Section 2.1.2:

Agitation will be incorporated either by a mechanical stirrer or by bubbling air through the molten glass.

14. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Page #: 4-8 Line #: 1 Code:
Original Comment #: 14
Comment: The text indicates that crucible melts will be performed to determine if a suitable glass is produced. Because the lab- and bench-scale studies included crucible melts, it is unclear why crucible melts are specified in the pilot plant study. The text should be revised to explain why crucible melts are specified.

Response: The specific composition of the feed will not match any prior crucible melt composition, because the prior tests focused on scoping tests and ranges for operation.

Action: The following will be added in Section 4.1 under "Slurry Tanks":

This crucible melt testing of the slurry tank contents has two purposes; to provide an initial indication of the behavior of that specific batch, and to identify any potential problems (such as phase separation) associated with vitrification of that particular batch.

15. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Page #: 4-8 Line #: 21 to 23 Code:
Original Comment #: 15
Comment: The text previously stated that the gem-forming machine from the Minimum Additive Waste Stabilization (MAWS) project would be used at OU4. These lines indicate that a new gem-forming machine will be purchased. The text should be revised to resolve this discrepancy.

Response: A new gem-forming machine will be purchased. The gem-forming machine design for the Pilot Plant is similar to the gem maker that is being used in the MAWS program. The text under Gem Forming Machine, Section 2.0, explains this.

Action: None.

16. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Page #: 4-9 Line #: 19 Code:
Original Comment #: 16
Comment: This section discusses the wastewater treatment system. The text should state where the treated water will be discharged.

Response: As discussed in Section 16.4.2, Page 16-6, Line 20, the wastewater stream will be treated by the FEMP advanced wastewater treatment system (AWWTS) prior to being discharged under the FEMP NPDES permit.

Action: The following will be added at the end of the paragraph after "Waste Water Treatment System" in Section 2.0:

The filtered water will be pumped to the existing High Nitrate Tank and become feed for the existing Bio-Denitrification System (BDN). At the time of operation, the Advanced Waste Water Treatment System (AWWTS) will be on-line to receive BDN effluent. This wastewater stream will be characterized to determine the appropriate means of treatment in the site AWWTS with the treated effluent being discharged under the NPDES permit. The AWWTS will use pH adjustment, flocculation, sedimentation, and ion exchange to remove dissolved radionuclides (for additional discussion of WWT, see Section 11.0).

17. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4 Page #: 4-11 Line #: 27 Code:
Original Comment #: 17
Comment: The text states that Phase II testing will end when "sufficient samples and data have been collected to demonstrate attainment of the goals to support remedial design." The purpose of Section 4.0., Experimental Design and Procedures, should be to describe in detail and to define exactly what constitutes "sufficient samples and data." A treatability study should consist of several well defined and unique test runs, such that the conditions and results of each test run can be compared to determine how the varied test conditions affect the test results. Section 4.0, specifically Subsection 4.4, should be revised to describe in detail the test conditions, variations between test runs, parameters to be measured, and measurement frequency.

Response: See Comment Response #9 (Test Plan).

Action: See Comment Action #9.

18. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.1 Page #: 4-14 Line #: 20 Code:
Original Comment #: 18
Comment: The text states that wastewater generated from the recycle water tank will only require treatment for suspended solids. The recycled water is used to create a slurry from the K-65 silo waste material and hence comes in direct contact with the K-65 waste. U.S. DOE should consider additional treatment for contaminants that may leach from the K-65 waste to the recycle water during the slurrying process or should discharge the pilot plant wastewater to the Interim Advanced Wastewater Treatment Plant instead of to the Biodenitrification system.

Response: The recycled water will be "pretreated" through the Pilot Plant multimedia wastewater filtration unit to remove suspended solids prior to being discharged to the High Nitrate Storage Tank, and onto final treatment by the AWWTS. Treatment of suspended solid will be the only "pretreatment" necessary prior to treatment of the wastewater by the AWWTS. The AWWTS is designed to treat wastewater for both metals and radionuclides. In addition, the effluent from the AWWTS will meet the requirements under the FEMP NPDES permit prior to discharge.

Action: The text in Section 4.1.1 will be revised to indicate Plant wastewater will be pretreated for suspended solids prior to discharge to the High Nitrate Storage Tank and on for treatment by the FEMP AWWTS.

19. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.2 Page #: NA Line #: NA Code:
Original Comment #: 19
Comment: Tables 4-1 and 4-2 are not referenced in the text and do not provide enough detail to be useful. The text should be revised to explain the information presented in these tables. The tables should be revised to clearly present the intended information.

Response: Agree.

Action: Text will be added to Section 4.1.2 and the Tables will be revised accordingly.

20. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.0 Page #: NA Line #: NA Code:
Original Comment #: 20
Comment: Section 5.0 should include all equipment and materials to be used in the pilot plant study. Table 5-1 does not include the type, grade or purity, and quantity of additives required for several of the unit operations. Therefore, the table should be revised to present this information.

Response: Agree.

Action: A separate table, Table 5-2, will be added to the work plan to show the additives, type, etc..

21. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.0 Page #: 6-2 to 6-12 Line #: NA Code:
Original Comment #: 21
Comment: Tables 6-1 and 6-2 present information that would be more useful if it was presented in smaller tables in the appropriate sections of the text. For example, sampling parameters correlated to performance objectives and data quality objectives should be presented in Sections 3.0 and 4.0. The information presented in Tables 6-1 and 6-2 should be reorganized to follow the examples presented in Attachment A, Tables A-2 and A-5.

Response: It is believed that Tables 6-1 and 6-2 covering sampling and analysis, as presented in Section 6.0 "Sampling and Analysis Management", are more useful than they would be if separated into smaller tables and dispersed throughout the document as requested. Tables 6-1 and 6-2 provide all process sampling and analysis information in one location

of the work plan and were intentionally arranged to correspond with the flow sequence and the sample points identified on the Process Flow Diagram (Figure 2-2). Section 3.0 sufficiently references Tables 6-1 and 6-2, and moving portions of the tables to Section 3.0, as suggested, would detract from the original intent. These tables correlate the sampling parameters to the objectives as requested by U.S. EPA.

Relative to the five tables provided with the U.S. EPA comments as the recommended format, Tables 6-1 and 6-2 address the same general categories and subsequent information. Therefore, it is believed that modification of the tables as suggested by the U.S. EPA would contribute no added value to the work plan.

Action: None.

cc:

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